Biofilms, spoilage microorganisms and meat products deterioration

Universitat Autònoma de Barcelona

Miguel Jiménez Cantero
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Aims

1. To **observe** the importance of **biofilms** for the food industry, focusing on **meat and meat products**.
2. To **understand** the role of ***quorum sensing*** and its relation to **food spoilage**.
3. To **recognize** the importance of **cleaning and disinfection**.

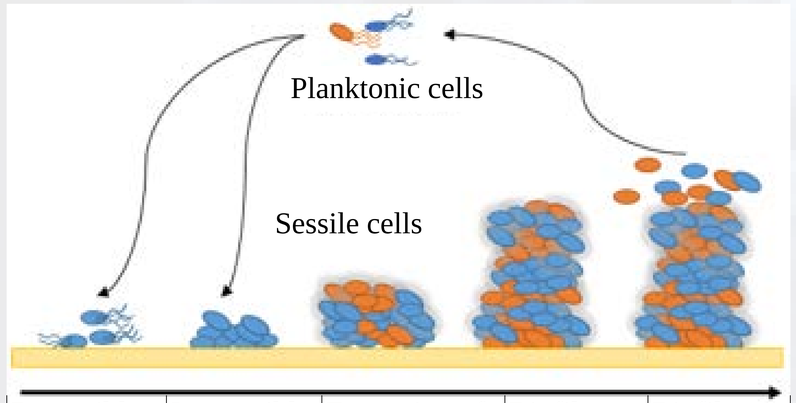


Figure 1. Process of multi species biofilm formation

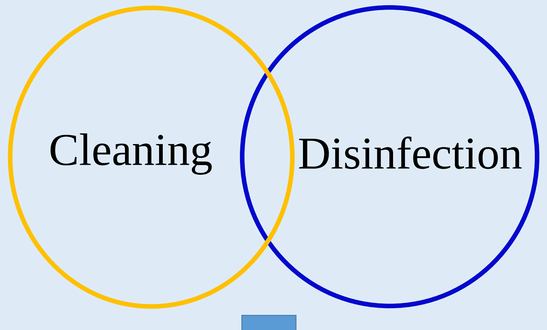
Meat and meat products [1]

- *Pseudomonas* spp.
- *Enterobacteriaceae*
- *Shewanella putrefaciens*

→ G -

Lactic acid bacteria → G +

Conventional sanitation



Is it enough?

Inhibition of *quorum sensing* [2]

→ **Preventive technique**

Alcohols

Rancid odor

Aldehydes

Putrid odor

Storage conditions

Quorum sensing [2]

Cell density

No. of autoinducers

Quorum threshold

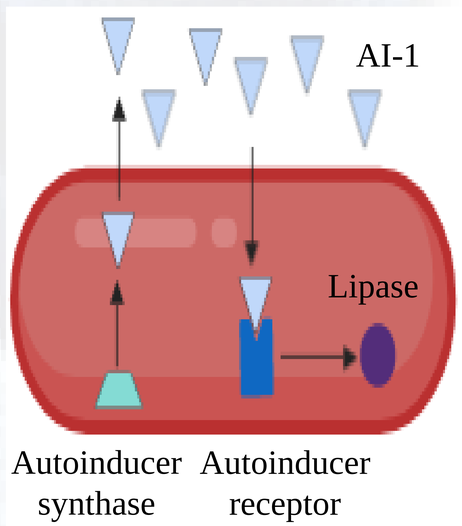


Figure 2. *Quorum sensing* system

Conclusions

1. **Gram negative bacteria** are the main spoilage microorganisms in **meat.**
2. ***Quorum sensing*** has a relevant **influence** on the formation of **deterioration substances** and **food spoilage**.
3. **Conventional sanitation** is **not enough** to prevent biofilms formation and **cross-contamination**.
4. **More** studies are **needed** to develop **new effective strategies** to combat these structures and thus raise standards in **food quality**.

References

[1] Møretrø T, Langsrud S. 2017. Residential bacteria on surfaces in the food industry and their implications for food safety and quality. Compr Rev Food Sci Food Saf. 16(5):1022–1041.

[2] Coughlan LM, Cotter PD, Hill C, Alvarez-Ordóñez A. 2016. New weapons to fight old enemies: novel strategies for the (bio)control of bacterial biofilms in the food industry. Front Microbiol. 7:1–21.